STUDIES ON THE MECHANISM OF BIO CORROSION IN AIRCRAFT FUEL TANKS

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Abstract

Bio-corrosion is a major problem faced in aircraft fuel tanks. Microbes attach to the surface by forming biofilm. AA2024-T3, the structural component used in aircraft fuel tanks was immersed in aviation fuel and aviation fuel+biofuel (1:1) to understand the mechanism of bio-corrosion. Anodised AA2024-T3 and Ormosil coated coupons were also evaluated for their corrosion protection efficiency. Kinetics of pH, viability and protein concentration were studied and accelerated corrosion tests performed to evaluate corrosion protection. The results indicated an indirect correlation between pH and microbial growth. Anodized AA2024-T3 (Icorr-0.075* $\mathbf{E^{-6}}$) and Ormosil + Benzotriazole coating (Icorr- 0.29* $\mathbf{E^{-6}}$) showed better corrosion protection than that of untreated AA2024-T3 immersed in fuel for 60 days. Interestingly, addition of biofuel to aviation fuel offered enhanced corrosion protection compared to fuel alone.